

A PRELIMINARY REPORT ON THE NOVEMBER 1982 SAMPLE OF
BARREN-GROUND CARIBOU FROM THE BEVERLY HERD

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CANADIAN WILDLIFE SERVICE



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SUMMARY

The preliminary results of a collection of 75 barren-ground caribou from the Beverly Herd in November 1982 indicate that the caribou were in relatively poor condition. For example, average values for body weight, depth of back fat, and weight of kidney fat of females over 3 years old were all lower than in March 1982. They were also lower than in the same class of females collected from the Kaminuriak Herd in November and December of the late 1960s.

INTRODUCTION

A study of the impact of fire on the Beverly Herd of barren-ground caribou (Rangifer tarandus groenlandicus) officially began in the 1982-83 fiscal year. A major component of that study is an assessment of the condition of caribou at the start and end of the winter period. The purpose is to learn if there is any indication that the present winter range is inadequate in quantity or quality for the present population of caribou. This report outlines some preliminary results of an examination of 75 caribou collected at Porter Lake from November 25 to 28, 1982.

Data on the condition of caribou in the herd were obtained in March of 1980, 1982, and 1982. Those samples were obtained in support of a study of forage digestibilities, and from collections jointly sponsored by government agencies and the Fort Smith Hunters and Trappers Association. The November samples are necessary, in addition to the March collections, in order to measure changes in condition over the winter period. Ideally, the sampling should occur in October and April

or May but the costs would spiral during freeze-up and breakup because of the need for helicopters and the greater distances of the herd from settlements.

METHODS

The distribution of caribou on the winter range was obtained on reconnaissance flights on November 23 and 24 and camp was established by single-engine Otter at Porter Lake on the 24th. From 25-28 November, 75 caribou were obtained by use of snowmobiles. Blood serum was obtained shortly after death from blood collected from major arteries forward of the heart. The only measurements taken in the field were weights, girth, maximum depth of back fat forward and lateral to the base of the tail, weight of the kidneys and the fat around them, and antler weight. The number of warble-fly larvae were counted on the hide, the ovaries and uteri were retained, bones from the right hind leg were taken for size and marrow fat determinations, and the jaw was taken for analysis of fat content and age. The age of each caribou was estimated in the field from the degree of tooth wear and this analysis is based on those ages. A later report will contain the data for ages estimated from numbers of annuli in the first incisor and first molar.

All the carcasses were transported by single Otter to Fort Smith for distribution by the Fort Smith H.T.A.

RESULTS

1. Composition of the sample (Table 1)

Estimates of age for the 75 caribou indicate that 42% of them were in the 1½-3½ year classes. Mature males (5½ years) were under-repre-

sented because they had already segregated themselves from the other classes and were as far south as Saskatchewan. Calves were selected against but little selection was thought to occur in the other classes. These data reflect the high survival of young caribou in the past few years. Caribou 1 3/4 - 3 3/4 years old constituted 46% of the sample of 132 caribou collected in March 1982. Excluding calves (less than 1 year old), the proportions of the next three age classes combined were 54% and 46%, respectively, in March and November 1982 samples.

2. Condition statistics (Table 2)

The average weight of females in each age class increased from 1½ years to the 5½-9½ age-class. Yearling females (1½ yr) were only 74% of the weight of the 5½-10½ age class, which indicates that growth is rather slow in the population. The lighter weight of males 4½ years old compared with those aged 3½ years is attributed to the small sample in the older class.

Back fat depths were low in all age classes of males except for the 4½ year class, where it varied from 0-17 mm in three males. It was also low in females up to 3½ years old and only of moderate depth in older ones.

Kidney fat is expressed as total weight of fat around the kidneys and as an index of (weight of fat/weight of kidneys) x 100. In males, the weight of kidney fat varied from 26 to 36 g in the first four age classes, and increased to 61 g in four older males. The kidney fat index decreased progressively in males aged ½ to 4½, reflecting increased weight of kidneys with age. Weight of fat on the kidneys of females

varied little with age, ranging from 56 g in yearlings to 89 g in two females aged $3\frac{1}{2}$ years. The kidney fat index also varied little with age in females, although no calves were present in the sample.

The numbers of warble fly larvae is not an index of condition but it may reflect the severity of harassment by that insect during July and August. The results suggest a moderate incidence of larvae, with much higher levels in males than in females.

3. Relative condition of Beverly Herd caribou in November

Condition indices reveal that caribou in the November sample were in about the same condition as in March 1980, and poorer than in March 1981 and 1982 (Table 3). Back fat depths may be the best indicator. Kidney fat weights are better than the kidney fat index for comparisons between March and November because kidney weights decrease during the winter.

The females over 3 years of age were 7 kg (15 lb) lighter at 91 kg (178 lb) in November than females $3\frac{1}{2}$ - $9\frac{1}{2}$ years old collected from the Kaminuriak Herd in November-December 1967-68 (Dauphiné 1976 C.W.S. Rep. Ser. 38:Table 18). Depths of back fat were 9 mm compared with 14 mm in the comparable sample from the Kaminuriak Herd. However, kidney fat was about the same in the two groups, averaging 72 and 73 g, respectively. We expect that the adult females will lose condition before the March sample. Adult (3 years) females in the Kaminuriak Herd showed significantly lower values for all the condition indices in April compared with November-December. In contrast, adult males recover fat deposits from November to April (Dauphiné 1976).

4. Parasites and Diseases

The general physical condition of many of the caribou, as judged by postmortem examination, was poor. A large number showed evidence of resolving, trauma-induced lesions in the carpal and hock joint regions. The trauma likely was caused by ice during river and lake crossings. Two adult females had hydatid cysts in their lungs. This is the intermediate form of the tapeworm Echinococcus granulosus which occurs in wolves, dogs, and foxes. The presence of hydatid cysts in the lungs may cause impairment of respiration through the destruction of lung tissue. A number of livers were infected with Cysticercus tenuicollis, the intermediate form of the parasite Taenia hydatigena that occurs in species such as the wolf.

The four blood samples proved to be negative from brucellosis. In view of the apparent increase in human brucellosis in the N.W.T., a greater attempt at collecting blood should be made to obtain an indication of the level of brucellosis in the Beverly Herd. The results of parasitological investigations of the fecal pellets will be available later.

DISCUSSION

The caribou in the Beverly Herd that were sampled in November 1982 were in relatively poor condition for that period of the annual cycle. The caribou sampled in March 1982 were in good condition. Therefore, the poor condition in November must relate to abnormally poor environmental conditions between late March and November 1982. The only obvious

87

weather difference was a late spring in 1982 compared with the two previous ones. The numbers of warble fly larvae suggest that harrassment by that fly was not unusual in July and August 1982. At present we have no data on the severity of mosquitoes and black flies in July and August. A detailed examination of weather records will be conducted later.

Some data on the ovulation and pregnancy rates will be obtained upon examination of ovaries and uteri collected in November. This and other information will be available after the laboratory work is completed in the summer of 1983. The data in this report is based on ages estimated from the degree of wear of molariform teeth. All the data in this report are therefore preliminary and subject to some changes but the overall conclusions about the condition of the caribou will not change.

It is important that the monitoring of conditions on the calving grounds and calf survival be continued over the next 3-4 years so that the relationship between physical condition of the caribou and calf survival can be investigated. We predict that calf survival in 1983-84 may decrease from the relatively high values recorded in the last 2 years. The influence of wolves on calf survival complicates the picture and studies aimed at monitoring changes in the numbers of wolves would complement the present studies that are in progress.

The plan is to continue the monitoring of condition in November 1983 and 1984 and March 1983, 1984, and 1985. The experience from northern studies shows clearly that little can be gained from data for only 1-2 years. The long-term studies have provided the only insights

into factors controlling wildlife populations. Conditions on the winter ranges will be monitored. Lack of funds and manpower prevent detailed monitoring during the summer months. The seriousness of that deficiency is unknown at present and difficult to predict.

ACKNOWLEDGEMENTS

This project is a joint venture of the Department of Indian Affairs and Northern Development, the N.W.T. Wildlife Service, C.W.S., and the Fort Smith Hunters and Trappers Association (F.S.H.T.A.). We thank the F.S.H.T.A., and particularly J. Schaefer, for providing hunters and much of the logistics for the sampling program in November. We thank O. Vandenberghe of DIAND in Fort Smith for use of the Porter Lake facility in November.

Table 1. Composition of the November 1982 sample of barren-ground caribou obtained at Porter Lake, N.W.T.

Age (yr) ^a	Females	Males	Both	% of Total
$\frac{1}{2}$	0	5	5	7
$1\frac{1}{2}$	8	7	15	20
$2\frac{1}{2}$	3	4	7	9
$3\frac{1}{2}$	1	9	10	13
$4\frac{1}{2}$	10	2	12	16
$5\frac{1}{2}$	25	1	26	35
Totals	47	28	75	100

^abased on degree of tooth wear.

Table 2. Sample statistics (mean $\pm$ SE, N) for the November 1982 collection of barren-ground caribou obtained at Porter Lake, N.W.T.

Sex/Age (yr)	Weight		Back fat depth (mm)	Kidney fat		No. warble fly larvae
	Pounds	Kg		Weight (g)	Index	
Male $\frac{1}{2}$	93 $\pm$ 5 (5)	42 $\pm$ 2 (5)	0.5 $\pm$ 0.3 (4)	26 $\pm$ 4 (4)	24 $\pm$ 3 (4)	71 $\pm$ 25 (4)
Female $1\frac{1}{2}$	134 $\pm$ 6 (8)	61 $\pm$ 3 (8)	5.0 $\pm$ 1.6 (8)	56 $\pm$ 11 (7)	45 $\pm$ 10 (7)	33 $\pm$ 11 (7)
Male $1\frac{1}{2}$	145 $\pm$ 7 (7)	66 $\pm$ 3 (7)	0.3 $\pm$ 0.2 (6)	32 $\pm$ 3 (6)	21 $\pm$ 3 (6)	61 $\pm$ 18 (6)
Female $2\frac{1}{2}$	155 $\pm$ 2 (3)	70 $\pm$ 1 (3)	1.7 $\pm$ 0.3 (3)	77 $\pm$ 10 (3)	49 $\pm$ 6 (3)	12 $\pm$ 5 (3)
Male $2\frac{1}{2}$	186 $\pm$ 9 (4)	84 $\pm$ 4 (4)	0.5 $\pm$ 0.1 (4)	32 $\pm$ 4 (4)	20 $\pm$ 2 (4)	21 $\pm$ 7 (4)
Female $3\frac{1}{2}$	175 $\pm$ 7 (2)	79 $\pm$ 3 (2)	21	89 $\pm$ 23 (2)	54 $\pm$ 11 (2)	-
Male $3\frac{1}{2}$	207 $\pm$ 7 (9)	94 $\pm$ 3 (9)	0.2 $\pm$ 0.2 (10)	36 $\pm$ 2 (9)	17 $\pm$ 1 (9)	30 $\pm$ 11 (9)
Female $4\frac{1}{2}$	176 $\pm$ 4 (8)	80 $\pm$ 2 (8)	9.0 $\pm$ 3.3 (9)	69 $\pm$ 10 (9)	45 $\pm$ 4 (10)	12 $\pm$ 4 (6)
Male $4\frac{1}{2}$	187 $\pm$ 14 (3)	85 $\pm$ 7 (3)	8.0 $\pm$ 5.0 (3)	61 $\pm$ 15 (3)	13	52 $\pm$ 43 (3)
Female $5\frac{1}{2}$ -10 $\frac{1}{2}$	180 $\pm$ 4 (18)	82 $\pm$ 2 (18)	9.4 $\pm$ 2.2 (19)	68 $\pm$ 6 (19)	40 $\pm$ 3 (19)	18 $\pm$ 7 (17)
Male $5\frac{1}{2}$ -10 $\frac{1}{2}$	255	116 $\pm$ (1)	0	62	21	341
Female $11\frac{1}{2}$	176 $\pm$ 5 (3)	80 $\pm$ 2 (3)	0.5 $\pm$ 0.5 (2)	69 $\pm$ 15 (3)	38 $\pm$ 9 (3)	30 $\pm$ 8 (2)

Table 3. Condition indices (means $\pm$ SE, N) of female caribou over 3 years of age in the Beverly Herd in March 1980-1982 and November 1982.

Month/Year	Body weight		Back fat depth (mm)	Kidney fat	
	Kilograms	Pounds		Weight (g)	Index
March 1980	80 $\pm$ 2 (13)	178 $\pm$ 4 (13)	4 $\pm$ 1 (14)	72 $\pm$ 4 (13)	47 $\pm$ 2 (13)
March 1981	84 $\pm$ 2 (5)	186 $\pm$ 6 (5)	20 $\pm$ 2 (12)	117 $\pm$ 10 (2)	77 $\pm$ 8 (12)
March 1982	84 $\pm$ 1 (55)	184 $\pm$ 2 (55)	17 $\pm$ 1 (49)	99 $\pm$ 4 (52)	61 $\pm$ 3 (51)
Nov. 1982	81 $\pm$ 1 (31)	178 $\pm$ 3 (31)	9 $\pm$ 2 (31)	72 $\pm$ 4 (32)	42 $\pm$ 2 (32)